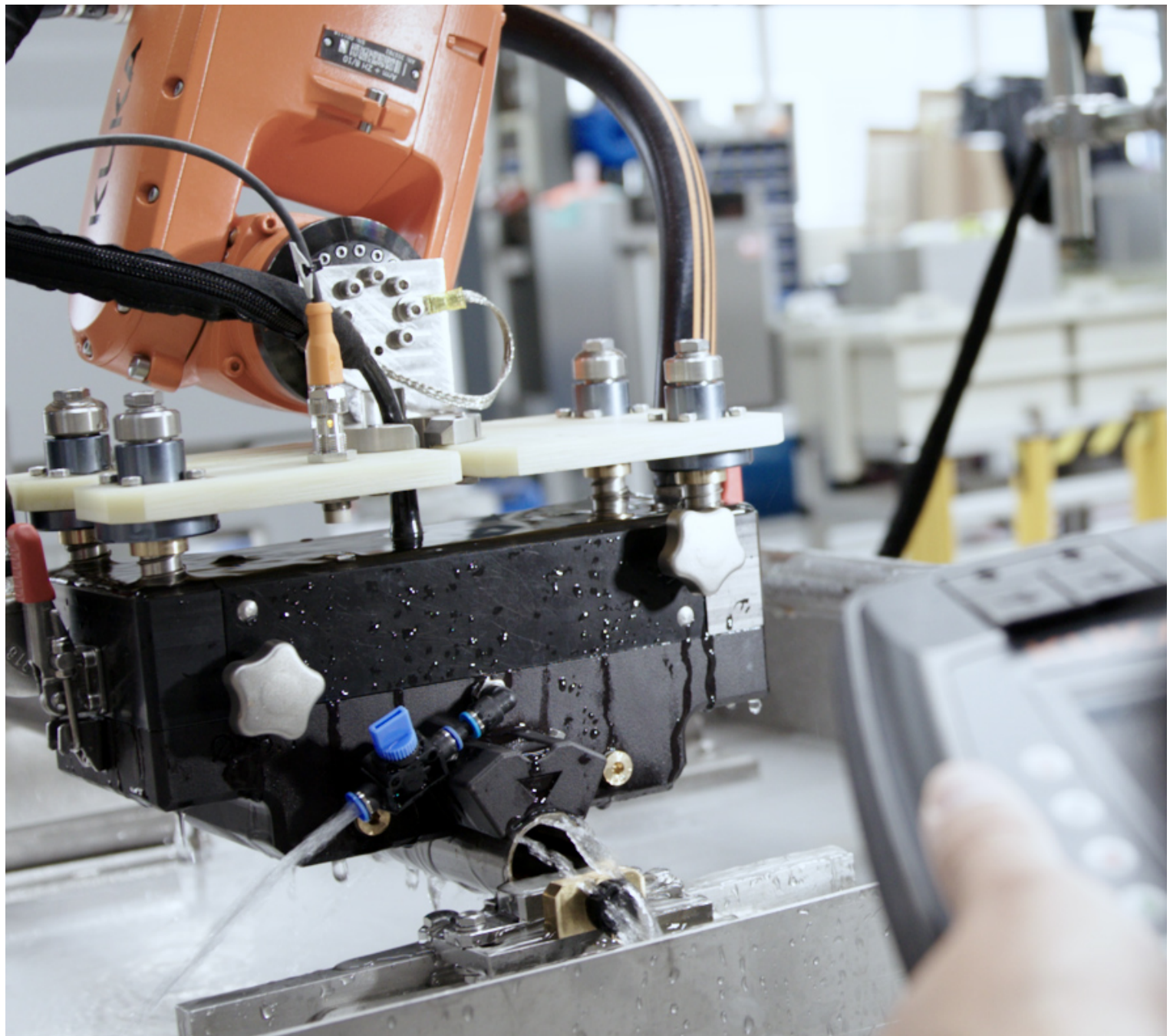


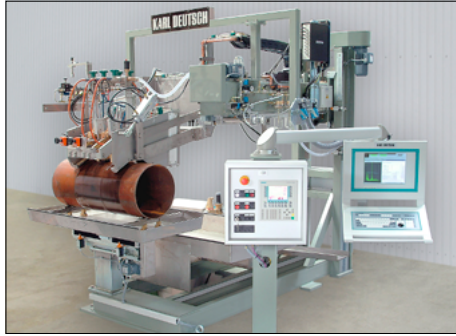


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Ultrasonic and PAUT Inspection of ERW-Pipes

KARL DEUTSCH

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Ultrasonic and PAUT Inspection of ERW-Pipes

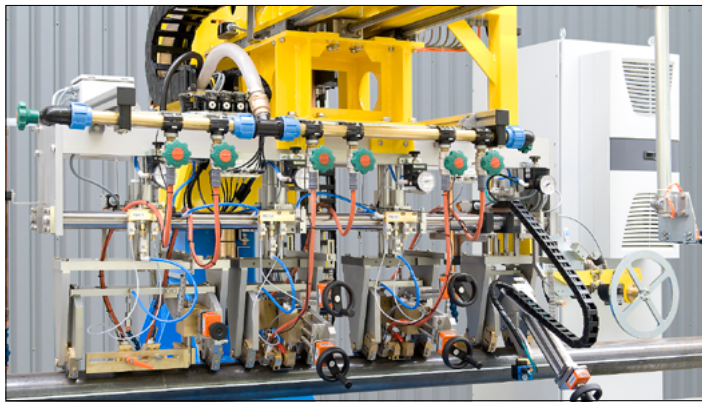


Online Testing System for ERW-Pipes. The probe holders can be moved between the testing position and the calibration position. In the calibration position, a short pipe segment is used for the sensitivity setting of all probes.

Ultrasonic Inspection of ERW-Pipes

The production of ERW-pipes includes several steps of NDT. The usage of NDT has two major goals: Early information about the welding procedure as a feedback for the production line and secondly, the final inspection of the finished pipe. Up to four ultrasonic systems are often encountered during the production process. As a first step, a strip tester can be used. Linear or oscillating test traces of the probes are possible. Directly after welding, a first online weld test is carried out with ultra-

sound. It is common to check for longitudinal defects only. Sometimes, an oscillating deburring check is added to verify the proper descarring of the internal pipe wall. After pipe cutting, a final weld inspection is carried out (offline weld testing). A testing portal with moveable carriage is commonly used. The testing portal shows the advantage that the weld is inspected without pipe movement, thus avoiding vibrations which could degrade the test results. The pipe ends can be tested in the same testing system or in a separate setup.



Probe holders for online testing machine (transverse and longitudinal defects)

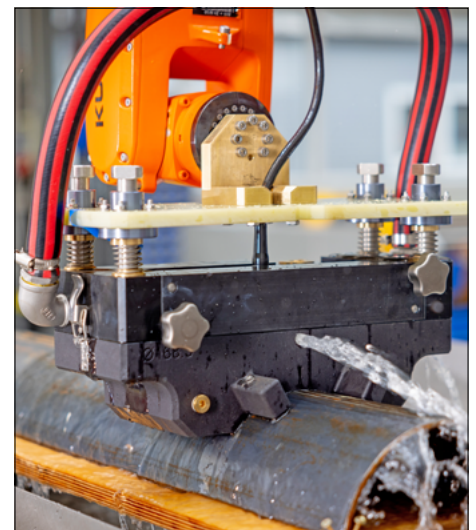


Example application: Ten probes for offline weld testing, six angle beam probes with water jet coupling. The incidence angle can be adjusted steplessly for perfect settings without changing the probe.

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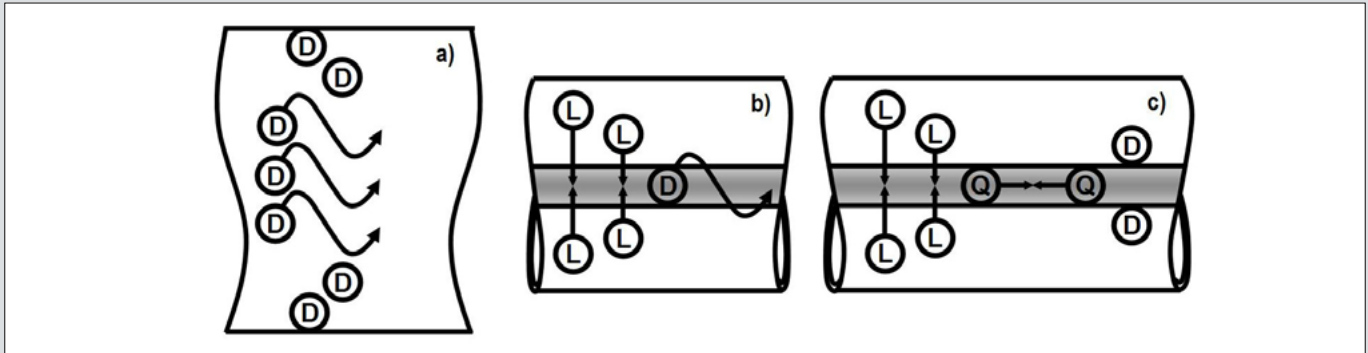
Key Features

- One single PA probe for longitudinal OD/ID testing and scarf monitoring
- Water gap coupling with wear shoe
- Scanning of the entire weld zone is ensured without mechanical adjustments
- Compact design



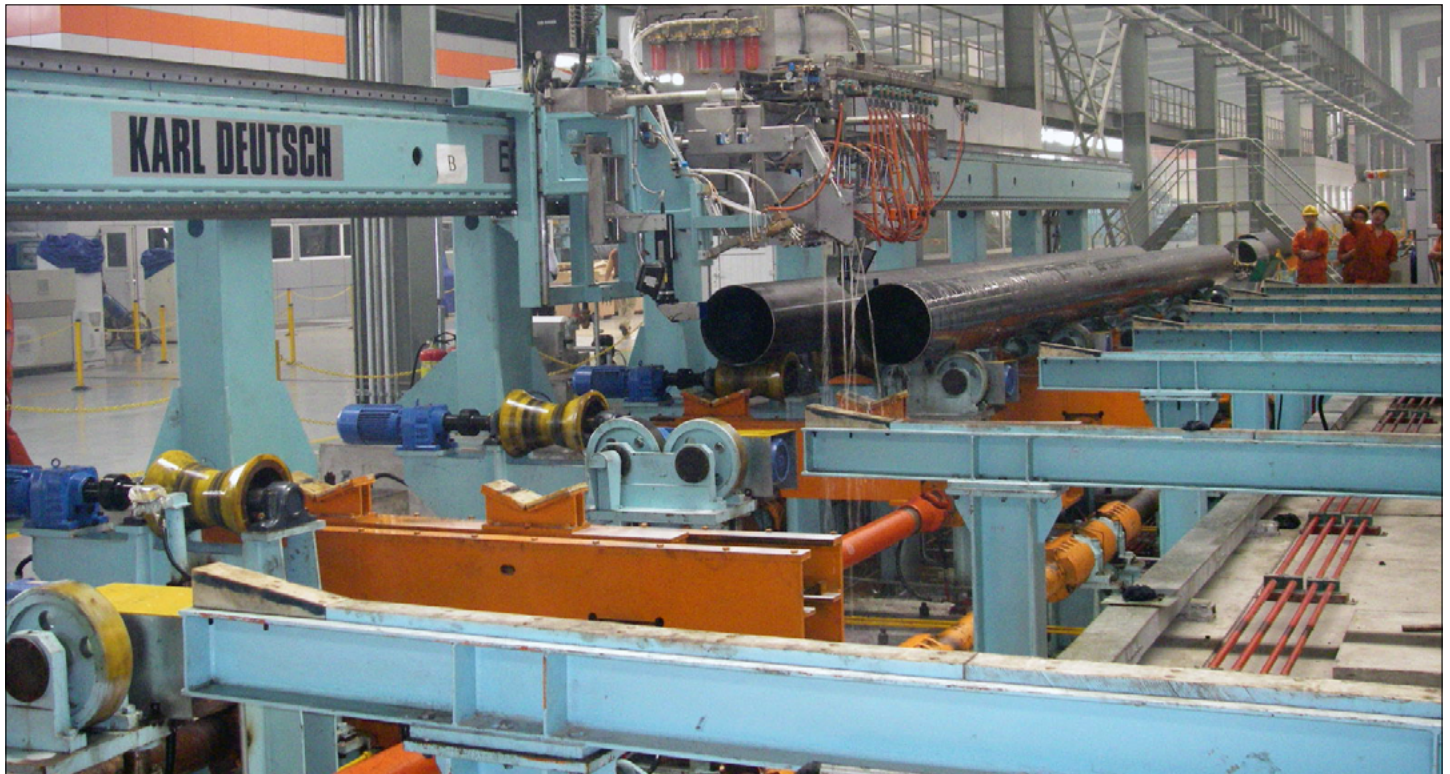
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Ultrasonic and PAUT Inspection of ERW-Pipes



Typical tasks for the ERW-pipe inspection:

- a) Strip inspection with edge probes and oscillating strip middle probes
- b) Online weld test with 4 probes for longitudinal defect detection and an oscillating deburring check
- c) Offline weld inspection with 4 probes for longitudinal defect detection, 2 on-bead probes for transverse defect detection and 2 probes for lamination testing in the heat-affected zone



Offline testing portal: Onsite operation with transverse conveyor for pipe feeding and linear discharging of the pipes. This machine was also equipped with two additional probe holders for the pipe end inspection.

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Ultrasonic and PAUT Inspection of ERW-Pipes



ECHOGRAPH SNHF	ECHOGRAPH SNHF PAUT
Applications	ERW-welded steel pipes (single or endless pipes)
Pipe diameter	up to 660 mm (to be discussed)
Wall thickness	3 – 30 mm
Pipe length	endless (online test) or 3 – 18 m (offline test)
Ovality	± 0.5% of diameter
Straightness deviation	max. 2 mm/m
Surface condition	as rolled, without loose scale
Pipe temperature	max. 80 °C
Inspection capabilities	▪ Flaw inspection for longitudinal (L), traverse (T) defects and lamination (LAM) defects in the heat-affected zones ▪ Optional: Flaw inspections for laminations in pipe end and pipe body ▪ Flaw inspection for longitudinal (L, ID & OD) and lamination (LAM) defects in the weld
Inspection speed	up to 60 m/min, depending on diameter, wall thickness etc.
Standards and compliance	ISO 10893 (Parts 8, 10, 11), ASTM E273, API 5L, ISO 3183, API 5CT
System options	▪ Flaw marking device for location-true separate marking of all flaws ▪ Extended diameter or wall thickness ranges ▪ Integration into Level 2 or MES systems ▪ Automated data exchange and reporting ▪ Remote service and diagnostics ▪ All ECHOGRAPH SNHF system options

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